

SPECIFICATIONS

European standard:

| | |
|-------|----------------------|
| EN | : NiCr20Co13Mo4Ti3Al |
| AFNOR | : NiCr20Co13Mo4Ti3Al |
| W.Nr | : 2.4654 |
| DIN | : NiCr19Co14Mo4Ti |
| AISI | : 685 |

COMPOSITION

| | |
|-----------------|-------|
| Carbon..... | 0.10 |
| Chromium..... | 19.00 |
| Colbalt..... | 14.00 |
| Molybdenum..... | 4.00 |
| Titanium..... | 3.00 |
| Aluminum..... | 1.50 |
| Nickel..... | Base |

TYPICAL MECHANICAL PROPERTIES

- Metal delivered in the heat treated condition:

| | |
|-------------------------|------------------------|
| - UTS: | 1250 N/mm ² |
| - 0.2 % Yield strength: | 770 N/mm ² |
| - Elongation (5d): | 25 % |

- Rapid tensile test at temperature:

| Temperature in °C | UTS in (N/mm ²) | 0.2 % Yield strength in (N/mm ²) | Elongation (5d) in % |
|----------------------|--------------------------------|---|-------------------------|
| 400 | 1180 | 720 | - |
| 600 | 1100 | 690 | 30 |
| 800 | 670 | 620 | - |
| 1000 | 160 | 120 | - |

- Creep:

| Temperature in °C | Average load in N/mm ² causing creep fracture in 1000 hrs |
|----------------------|---|
| 700 | 430 |
| 800 | 190 |

APPLICATIONS

Superalloy for:

- Extrusion dies.
- Glassware tools (MPYV).
- Forging machine chucks.
- Compaction moulds.
- Drilling punches.
- Dies for heavy metal casting.
- Isothermal presses

CHARACTERISTICS

Precipitation hardened, nickel-based superalloy:

- Excellent corrosion resistance
- Excellent mechanical properties up to 950°C

HEAT TREATMENT

- Delivered in the heat treated condition
- Other conditions of supply on request

PHYSICAL PROPERTIES

- Density: 8.20
- Mean coefficient of expansion in $m/m.^{\circ}C$:
 - between 20°C and 200°C: 12.6×10^{-6}
 - between 20°C and 400°C: 13.3×10^{-6}
 - between 20°C and 600°C: 14.2×10^{-6}
 - between 20°C and 800°C: 15.7×10^{-6}
- Modulus of elasticity in N/mm^2 :
 - at 20°C: 209×10^3
- Thermal conductivity in $W.m/m^2.^{\circ}C$:
 - at 20°C: 10.5
 - at 200°C: 12.5
 - at 400°C: 15.5
 - at 600°C: 18.8
 - at 800°C: 20.5
- Specific heat in $J/g.^{\circ}C$:
 - at 20°C: 0.51
 - at 200°C: 0.53
 - at 400°C: 0.57
 - at 600°C: 0.61
 - at 800°C: 0.65

FORGING

- 1200 / 800°C

Contact:

www.aubertduval.com

The data provided in this document represent typical or average values rather than maximum or minimum guaranteed values. The applications indicated for the grades described are given as guidance only in order to help the reader in his personal assessment. Please note that these do not constitute a guarantee whether implicit or explicit as to whether the grade selected is suited to specific requirements. Aubert & Duval's liability shall not under any circumstances extend to product selection or to the consequences of that selection.